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VALUE OF
FAMILY HISTORY AND PERSONAL CONDITION
IN
ESTIMATING A LIABILITY
TO
CONSUMPTION

presented by the author —



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WITH THE COMPLIMENTS OF
The Mutual Life Insurance Company of New York

Richard W. Luedy

President.

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VALUE OF FAMILY HISTORY AND PERSONAL CONDITION IN ESTIMATING A LIABILITY TO CONSUMPTION

RICHARD A. McCURDY, ESQ.,

President.

Sir:

About twenty years ago a complete analysis was made of the Mortuary Records of this Company up to that date. Especial attention was given to the losses from consumption, and some valuable conclusions were drawn from the results of this experience. Since that time, similar investigations have been pursued, and statistics have been compiled by physicians from the experience of other Life Insurance companies and from general medical practice. The main subjects of these studies have had reference to the transmission by inheritance of consumptive tendencies, and the respective values of family and personal qualities as indicating a liability to consumption. Very recent discussions in the medical

societies show that the questions are still unsettled, and that a wide latitude of opinion prevails among physicians. Believing that the experience which has been acquired by this Company since the former report might tend to settle some of these undetermined problems, I have carefully examined and analyzed our recent records, and submit the following report.

The material used for this report consists of twenty-two thousand and eighty-five cases, being the entire mortality during the fifteen years from 1879 to 1893. The original application and death proofs were examined, and an abstract made on cards of the family record and personal condition at the time of insurance, and the cause of death. In a very few of the earliest cases the statements are deficient on some of these points. From this material all the cards were selected which gave any record of consumption in the family. The number of such cases was nineteen hundred and ninety-four. A class of cases with "tainted record" is thus made, from which the importance of such taint can be deduced. The class thus separated might be compared with the "total remaining," but for satisfactory reasons it is preferable to employ only an approximately equal number of cases. This has been done by taking all the deaths which occurred in the beginning, middle and end of the whole period, namely, in 1879, 1886 and part of 1893, amounting to twenty-seven hundred and six cases. Two classes are thus made, which

differ in no respect except as to the presence or absence of a family record of consumption at the time of insurance.

Proceeding to an analysis of this experience, we have:

TABLE NO. 1.

SHOWING THE MORTALITY FROM CONSUMPTION IN NON-CONSUMPTIVE AND CONSUMPTIVE FAMILIES.

Age at Death and Cause of Death		Non-consumptive Families	Consumptive Families
To 29 years	All causes	106	60
	Consumption	38	31
	Percentage	35.8	51.6
30 to 39 "	All causes	372	194
	Consumption	98	77
	Percentage	26.3	39.6
40 " 49 "	All causes	566	284
	Consumption	100	70
	Percentage	17.6	24.6
50 " 59 "	All causes	724	489
	Consumption	49	77
	Percentage	6.7	15.7
60 " 69 "	All causes	613	569
	Consumption	36	47
	Percentage	5.8	8.2
70 " 79 "	All causes	325	398
	Consumption	12	8
	Percentage	3.7	2.2
Total Deaths - -		2706	1994

This table shows that the percentage of deaths from consumption has been much larger in the "tainted" than

in the "non-tainted" class; and that this increased proportion exists at every decennial period of life until extreme old age.

To form a correct estimate of the value of such record, as an indication of the liability to consumption, the cases should be viewed as they present themselves when applicants for insurance. It is at this time that the medical examiner must decide as to the eligibility of the proponent, and the family record is considered an important element in this decision. The age of the applicant himself may be a qualifying condition, for the influence of family inheritances and tendencies is believed to vary at different periods of life.

In the following table, therefore, the cases have been grouped according to the age at insurance:

TABLE NO. 2.
SHOWING THE MORTALITY FROM CONSUMPTION IN NON-
CONSUMPTIVE AND CONSUMPTIVE FAMILIES.

Age at Insurance and Cause of Death		Non-consumptive Families	Consumptive Families
To 29 years	All causes	473	255
	Consumption	135	96
	Percentage	28.5	37.6
30 to 39 "	All causes	903	674
	Consumption	120	136
	Percentage	13.3	20.2
40 " 49 "	All causes	813	596
	Consumption	54	55
	Percentage	6.8	9.2
50 years and upwards	All causes	517	469
	Consumption	24	23
	Percentage	4.6	4.9

It would appear from this table that the importance which has been attached to a family record of consumption is not modified by the age of the applicant; for the influence of this taint is shown as clearly in persons between forty and fifty years as in those between twenty and thirty years of age. With regard to those who were above fifty years at the time of insurance, there has been no difference between the two classes of "tainted" and "non-tainted" in rate of mortality from consumption; but, the actual number of deaths from this disease having been very small, the natural inference is not conclusive. The higher rate of difference between the two classes at the ages of thirty to forty years is also probably accidental, and might be modified in another series of observations. It must be remembered that these tables indicate only the rate of consumption in the total mortality, and not the number of deaths that have occurred in proportion to the number of living at each period of life. The actual mortality from consumption remains nearly constant at all ages, but its ratio among the total causes of death diminishes with advancing years, on account of the appearance and rapid increase of other diseases. In early manhood, consumption is a principal cause of death; after middle age, degenerative diseases of the circulatory and nervous systems cause it to assume a less conspicuous position.

In the table given on page 6, the percentage of con-

sumption for persons insured at ages twenty to thirty years was 28.5 per cent. among those with untainted record, and about one-third greater, or 37.6 per cent., among those with tainted record; at ages from forty to fifty years it was 6.8 per cent. for the untainted, and one-third greater, or 9.2 per cent., for the tainted; the proportion of increase being the same in both cases. From these figures it is evident that a consumptive family record is of considerable value as indicating an increased liability to consumption in an applicant, and that the amount of this increased liability may be estimated at thirty per cent. This estimate holds good until the age of fifty years is reached, after which age no difference is apparent between the classes. For the latter period, however, the statistics are too small to warrant any safe conclusion.

The degree of inherited predisposition, and the resulting liability to a disease, is often estimated by the number and relationship of the members of the family who have been previously affected. A family history exhibiting two or more consumptives is generally considered more significant than the record of a single case; and the death of a parent as more ominous than that of a brother or sister.

Life Insurance experience and statistics cannot settle this point, but may throw some light upon it. The original selection of the risks was influenced by

the family record of the applicants, and applicants belonging to families in which the consumptive taint was strongly marked were excluded from insurance. A record of the disease in both parents, or in two or three members of the family, was, as a general rule, considered a bar to acceptance, and therefore our experience in this class of cases is comparatively limited. Almost all of those admitted with a record showing taint in two members were above forty years of age, partly as the result of unfavorable selection at younger ages, and partly for the natural reason that as life advanced the family record would be more complete, and would give more deaths from all causes, including consumption.

An elaborate table has been prepared, and is here given (Table No. 3), showing the proportionate mortality from consumption and other causes among those with tainted record, and arranged according to the degree of taint and the age at insurance.

TABLE No. 3.

SHOWING THE PROPORTIONATE MORTALITY FROM CONSUMPTION AND OTHER CAUSES AMONG THOSE WITH TAINTED RECORD, AND ARRANGED ACCORDING TO THE DEGREE OF TAINT AND THE AGE AT INSURANCE.

Family Record of Consumption		Age at Insurance				
Member of Family Affected		Total	20-29 Years	30-39 Years	40-49 Years	50 Years Up- wards
No member affected	Deaths from all causes	2706	473	903	813	517
	“ Consumption	333	135	120	54	24
	Percentage	12.7	28.5	13.3	6.8	4.6
Both parents	Deaths from all causes	7	..	1	2	4
	“ Consumption	1	1	..
	Percentage	14.3	50.0	..
Father . .	Deaths from all causes	343	69	136	86	52
	“ Consumption	66	30	22	9	5
	Percentage	20.7	43.3	16.1	10.4	9.6
Mother . .	Deaths from all causes	457	79	156	135	87
	“ Consumption	71	29	28	10	4
	Percentage	15.5	36.5	17.1	7.5	4.6
Parent and brother or sister . .	Deaths from all causes	120	11	42	36	31
	“ Consumption	13	2	9	2	..
	Percentage	11.0	18.2	21.4	5.5	..
One brother or sister .	Deaths from all causes	933	88	306	284	255
	“ Consumption	133	30	63	29	11
	Percentage	14.3	34.1	20.6	10.2	4.3
Two or more brothers or sisters . .	Deaths from all causes	134	8	33	53	40
	“ Consumption	26	5	14	4	3
	Percentage	19.4	62.5	42.4	7.5	7.5
Two mem- bers affect- ed . .	Deaths from all causes	261	19	76	91	75
	“ Consumption	40	7	23	7	3
	Percentage	15.3	36.8	30.3	7.7	4.0
One member affected	Deaths from all causes	1733	236	598	505	394
	“ Consumption	270	89	113	48	20
	Percentage	15.6	37.2	18.5	9.2	5.1
Parent and brother or sister . .	Deaths from all causes	120	11	42	36	31
	“ Consumption	13	2	9	2	..
	Percentage	11.0	18.2	21.4	5.5	..
Two or more brothers or sisters . .	Deaths from all causes	134	8	33	53	40
	“ Consumption	26	5	14	4	3
	Percentage	19.4	62.5	42.4	7.5	7.5
One parent .	Deaths from all causes	800	148	292	221	139
	“ Consumption	137	59	50	19	9
	Percentage	17.1	39.8	17.1	8.6	6.5
One brother or sister	Deaths from all causes	933	88	306	284	255
	“ Consumption	133	30	63	29	11
	Percentage	14.3	34.1	20.6	10.2	4.3

Under this tabulation the numbers for each subdivision are small, and the fluctuations great, and consequently the deductions or conclusions should be very guarded. On one point, however, the evidence is conclusive, namely, that the death of a brother or sister is of equal significance with that of a parent.

There has been little restriction in the acceptance of risks in which the family history showed only a single death from consumption, whether this death may have been in a parent or brother or sister; consequently, the experience with this degree of taint has been large and correspondingly reliable. A comparison of the two subdivisions of family taint—taint in a parent, and taint in a brother or sister—shows decided fluctuations in the mortality from consumption, sometimes one class and sometimes another presenting the highest percentage; but, on the whole, the results are nearly equal. The predisposition or tendency to consumption is rather a “family” than an “inherited” influence. It may proceed directly from a phthisical or other constitutional taint in the parents, or may be acquired after birth by the conditions and environment common to all the members of the family during the periods of childbirth and youth, including the possibility of direct personal contagion. The significance of this kind of “family” taint is shown with still greater force in the subdivision marked “two or more brothers or sisters.” In this group the percentage of

deaths from consumption reaches the maximum, and at the earlier ages far exceeds that of any other group. The death of both parents has been considered to indicate such an extreme danger of taint in the descendants, as to be generally a bar to insurance. Consequently, we find in our records only seven of this class, who were probably accepted as exceptions to the general rule on account of extremely favorable conditions of age, physique and habits. The appearance of consumption in two generations is also considered very unfavorable, but, probably owing to extreme care taken in the examination and selection of applicants with this history, our experience has been very favorable. The subdivision showing a record of "parent and brother or sister" gives the very smallest percentage of consumption of any class with tainted family record, equal in fact to the general class with no taint. The total number in this subdivision is not large, and the results therefore may be accidental; but I believe that special care in selection, in view of the recognized danger of family predisposition, has had a decided influence in effecting the favorable results.

This leads naturally to the second point for investigations, namely, whether favorable personal conditions may not equalize or even overbalance unfavorable conditions of family predisposition. The record of a death from consumption establishes a presumption that the other members of the family have a predisposition to, and an

increased probability that some of them will die from this disease. Only a small proportion of these individuals, however, subsequently do die of consumption, and therefore there must be some other conditions which neutralize or counteract this tendency. It is probable that one of these personal conditions is that which is generally known as robustness, indicated by muscular vigor and strength, weight of body and capacity of chest. A prerequisite for this result is a condition of the digestive processes, shown by the power to take up and assimilate a large amount of nutriment. Our previous examination and report on this subject, which has been corroborated by similar reports of others, proved that the vast majority of consumptives were persons below the average weight; but the statistics were not sufficiently numerous to admit of subdivisions according to age. Now, the highest percentage of consumption mortality and the highest proportion of underweights are found before middle age; the least percentage of consumption mortality and the highest proportion of overweights, after middle age: consequently, as the bodily weight and increasing years advance together, there was a probability that what was attributed to weight was merely due to age. Our present experience should be sufficiently large to establish the value of this personal condition in indicating a consumptive tendency, or in modifying for better or worse any influence of inheritance, and I have examined the question by analyzing the series of cases

which is the subject of this report. The total number is somewhat reduced, for the reason that in the earliest records of the Company the examination papers do not show the height and weight. The standard of measurement mentioned is that habitually used by the Company's Examiners, except that for persons under the age of thirty years a deduction of five pounds was made, to correspond with the normal weight for that period of life.

The following table is made from the class in which there was no history of family phthisis:

TABLE NO. 4.
NO HISTORY OF FAMILY PHTHISIS.

Age at Insurance and Cause of Death		Weight	
		At or above Average	Below Average
To 29 years	All causes	197	226
	Consumption	35	93
	Percentage	17.8	41.1
30 to 39 "	All causes	412	382
	Consumption	35	73
	Percentage	8.5	19.1
40 " 49 "	All causes	476	271
	Consumption	22	29
	Percentage	4.6	10.7
50 years and upwards	All causes	335	151
	Consumption	9	14
	Percentage	2.7	9.3

It is here seen that for persons with untainted record there have been twice as many deaths among those below than those above the average weight, and that this disproportion prevails equally at all ages. Those

below the average appear to be twice as susceptible to the disease, and therefore the condition of bodily development is of very great importance in indicating the presence of the phthisical predisposition. This indication is of equal value at all periods of life; for, while the actual percentage of deaths from consumption is greatest in early life, the disproportion between the two classes continues constant for all ages. On the other hand, a good and robust physical development with absence of family taint does not ensure against the danger of consumption, but only diminishes very greatly the probability of its occurrence.

The next table gives the cases in which there was some record of family phthisis.

TABLE No. 5.
SOME RECORD OF FAMILY PHTHISIS.

Age at Insurance and Cause of Death		Weight	
		At or above Average	Below Average
To 29 years	All causes	88	141
	Consumption	22	69
	Percentage	25.0	48.9
30 to 39 "	All causes	273	308
	Consumption	31	87
	Percentage	11.3	28.2
40 " 49 "	All causes	328	191
	Consumption	22	27
	Percentage	6.7	14.1
50 years and upwards	All causes	288	151
	Consumption	10	11
	Percentage	3.5	7.3

As was to have been anticipated, the percentage from consumption is here somewhat greater under each subdivision; but the difference between the two classes of over and under weight is almost exactly the same as in the last table. Those who possessed a physical robustness and weight up to the average gave only one half as many deaths as those below the average, and this proportion was constant at all ages. A comparison of figures in the tables will also show clearly that, as far as our experience has gone, the family history has influenced the consumption death rate far less than has the personal condition, and that therefore it is a less valuable indication of an underlying phthisical predisposition. A proper discrimination of the relative values of these two factors is very important, and the following diagrams have been prepared with a view to making them more clear and striking. It must be remembered, however, that the diagrams are based on the rate of consumption in proportion to other causes of death, and not on the number of deaths in relation to the lives exposed. If this were overlooked, it might be inferred that consumption was of rare occurrence after middle age, whereas it is as frequent then as in early life, but its percentage is diminished by the steady increase of other fatal diseases.

DIAGRAM ILLUSTRATING THE INFLUENCE OF FAMILY RECORD AND PERSONAL WEIGHT, SEPARATELY AND COMBINED,
IN MODIFYING THE PROPORTION OF CONSUMPTIVE DEATHS IN THE TOTAL MORTALITY.

AGES AT INSURANCE UNDER 30 YEARS.



DIAGRAM ILLUSTRATING THE INFLUENCE OF FAMILY RECORD AND PERSONAL WEIGHT, SEPARATELY AND COMBINED,
IN MODIFYING THE PROPORTION OF CONSUMPTIVE DEATHS IN THE TOTAL MORTALITY.

AGES AT INSURANCE 30 TO 39 YEARS.



DIAGRAM ILLUSTRATING THE INFLUENCE OF FAMILY RECORD AND PERSONAL WEIGHT, SEPARATELY AND COMBINED,
IN MODIFYING THE PROPORTION OF CONSUMPTIVE DEATHS IN THE TOTAL MORTALITY.

AGES AT INSURANCE 40 TO 49 YEARS.

Family record	Untainted	(Consumption) 6.8	All other causes 93.2
	Tainted	(Consumption) 9.2	All other causes 90.8
Weight	Above average	(Consumption) 5.5	All other causes 94.5
	Below average	(Consumption) 12.1	All other causes 87.9
Above average weight	Untainted record	(Consumption) 4.6	All other causes 95.4
	Tainted record	(Consumption) 6.7	All other causes 93.3
Below average weight	Untainted record	(Consumption) 10.7	All other causes 89.3
	Tainted record	Consumption 16.8	All other causes 83.2

DIAGRAM ILLUSTRATING THE INFLUENCE OF FAMILY RECORD AND PERSONAL WEIGHT, SEPARATELY AND COMBINED,
IN MODIFYING THE PROPORTION OF CONSUMPTIVE DEATHS IN THE TOTAL MORTALITY.

AGES AT INSURANCE 50 YEARS AND ABOVE.

Family record	Untainted	(Consumption) 4.6	All other causes 95.4
	Tainted	(Consumption) 4.9	All other causes 95.1
Weight	Above average	(Consumption) 3.0	All other causes 97.0
	Below average	(Consumption) 8.3	All other causes 91.7
Above average weight	Untainted record	(Consumption) 2.7	All other causes 97.3
	Tainted record	(Consumption) 3.5	All other causes 96.5
Below average weight	Untainted record	(Consumption) 9.3	All other causes 90.7
	Tainted record	(Consumption) 7.3	All other causes 92.7

These diagrams show through the eye what has already been demonstrated by the tables of figures, namely, that both the history of phthisis in the family and the condition of personal underweight indicate an increased liability to consumption, and that these factors differ considerably in the degree of their influence. The family history exhibits much less influence than the weight, and a good record of weight overbalances tainted family history. The combination of the two factors indicates the maximum, and the absence of both, the minimum of susceptibility.

While mindful that individuals with a very unfavorable family record have as a rule been rejected, and that therefore our experience has been to this extent limited, I believe that the statistics given in this report warrant the following conclusions:

1st. That the history of consumption in any member of the immediate family increases the probability of its appearance in an applicant.

2d. That consumption in a brother or sister is at least of equal importance as when it has occurred in a parent.

3d. That persons who are under the standard or average of weight are much more liable to consumption than those above this standard. That the peculiarity of constitution which is indicated by the inability to take and assimilate a proper amount of nutriment indicates a

susceptibility to phthisis, or at least is a reasonable suspicion of such predisposition.

4th. That persons who exhibit a robust and well developed body have little susceptibility to consumption.

5th. That the personal condition of weight and robustness has far more value than the family history in diminishing the liability to consumption; therefore,

6th. The evidence presented by a well developed body may outweigh the suspicion attached to unfavorable family record.

7th. That these influences of family history and personal weight are of the same grade for every age, and their importance is not lessened by the fact that the individual has reached middle life.

In deciding upon the eligibility of an applicant for Life Insurance, in whose case there is a suspicion of future danger from consumption, his personal condition is of the first, and his family record of the second importance. Whenever he presents a robust physical appearance, with a weight at least equal to the standard or average as given in our tables, he may be accepted, notwithstanding any taint in the record of his family. In our experience such persons have a small liability to consumption, although not protected from it. If, however, his weight does not come up to the average and he gives a history of consumption in brothers, sisters or parents, he is to be regarded as an unfavor-

able risk. This does not mean that all such persons are to be absolutely excluded from insurance, but each case must be carefully scrutinized, and the decision based upon the circumstances of occupation, character, past history, etc. When these are favorable, insurance should be given on terms most advantageous to the Company, by limiting the amount or modifying the form of policy; when unfavorable, the applicant should be either postponed until he has gained sufficient weight, or else be absolutely rejected.

Respectfully submitted,

E. J. MARSH, M. D.,

Medical Director.

NEW YORK, April 15, 1895.

